REPTILES & AMPHIBIANS

# Himalayan Toad (*Duttaphrynus himalayanus*) Tadpoles Feeding on a Mammalian Carcass in the Western Himalayas of India

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Most free-living tadpoles are microphagous, suspension-feeding herbivores and detritivores (Altig et al. 2007; Whiles et al. 2010). However, tadpole feeding is influenced by morphological, physiological, and behavioral traits (Seale and Wassersug 1979) and instances of opportunistic oophagy, necrophagy, and carnivory, including cannibalism, have been documented (Polis and Myers 1985; Kupferberg et al. 1994; Hoff et al. 1999; Mahapatra et al. 2017). Toad tadpoles typically consume algae, remnants of insects, and any animal or plant material that has been adequately softened by water or bacterial processes (Bragg 1940), feeding primarily on detritus that has settled to the bottom and material scraped from submerged rocks (Ray 1999).

Carnivory has been documented in tadpoles of multiple species (Jordan et al. 2004; Silva et al. 2005; Kovács and Sas 2009; Alvarez 2013; Alvarez et al. 2021; Clemens et al. 2021). For example, Great Plains Toad (*Anaxyrus cognatus*) tadpoles feed on insect remains and dead animals (Bragg 1940), Striped Toad (*Rhinella crucifer*) tadpoles on Blacksmith Treefrog (*Hypsiboas faber*) carcasses (Kirchmeyer et al. 2015), Cuban Treefrog (*Osteopilus septentrionalis*) tadpoles on insect carcasses (Street et al. 2013), Spot-legged Treefrog (*Polypedates megacephalus*) tadpoles on an unidentified toad (Trivedi et al. 2018), and Western Toad (*A. boreas*) tadpoles on the carcass of an American Bullfrog (*Lithobates catesbeianus*) (Alvarez and Wilcox 2021). Cannibalism has been documented in tadpoles of the Western Toad (*Anaxyrus boreas*) and California Red-legged Frog (*Lithobates draytonii*) (Jordan et al. 2004; Alvarez 2013; Frost 2023).

In India, facultative carnivory has been observed in tadpoles of the Asian Common Toad (*Duttaphrynus melanostictus*) feeding on conspecific and heterospecific tadpoles (Mahapatra et al. 2017), Himalayan Toad (*D. himalayanus*) and Himalayan Paa Frog (*Nanorana vicina*) feeding on the carcass of a Himalayan

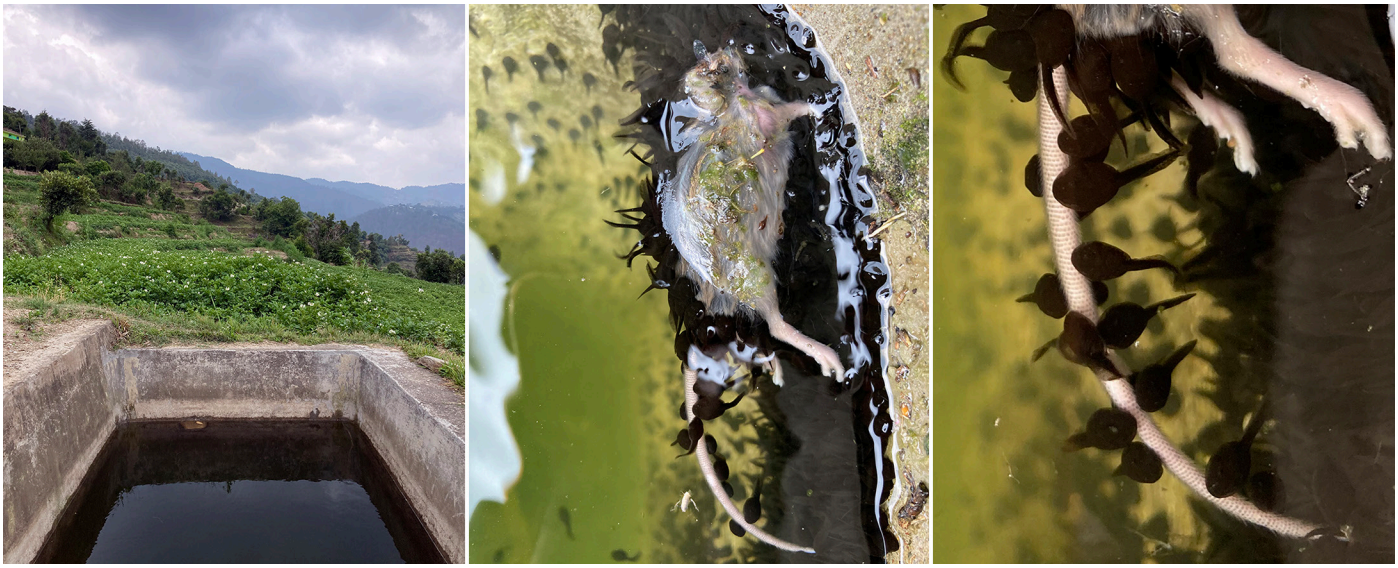

**Figure 1.** An artificial tank surrounded by agricultural fields in Nainital, Uttarakhand, India (A), where Himalayan Toad (*Duttaphrynus himalaynus*) tadpoles were feeding on a Little Indian Field Mouse (*Mus* cf. *booduga*) carcass (B & C). Photographs by Tuheina Thakur.

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Toad (*D. himalayanus*) (Banerjee et al. 2020); Cricket Frog (*Minervarya* sp.) feeding on a carcass of Dutta's Toad (*Duttaphrynus* sp.) (Gazdar et al. 2019); and Indian Bullfrog (*Hoplobatrachus tigerinus*) feeding on tadpoles of the Marbled Toad (*Firouzophrynus stomaticus*) (Khan 1996) and on an Ornate Narrow-mouthed Frog (*Microhyla ornata*) (Vyas 2013).

At 1200 h on 27 May 2022, we observed facultative carnivory by Himalayan Toad tadpoles feeding on the carcass of a Little Indian Field Mouse (*Mus* cf. *booduga*) in an artificial cement tank (5 x 3 m) used for irrigation and surrounded by agricultural fields near Nainital, in the Kumaon Mountains of Uttarakhand, India (29.38972, 79.73806; elev. 1,720 m asl) (Fig. 1). Himalayan Toads, which are widely distributed in the Himalayan Region (Vasudevan and Sondhi 2010), are known to breed in such artificial pools (Ray 1999). The dark brown-black tadpoles, identified by their rounded snouts and dorsolateral orientation of the eyes (Raj et al. 2023), typically are benthic feeders found in shallow, lotic, and shoreline habitats (Ray 1999).

We observed this feeding behavior for 30 minutes. Tadpoles were nibbling on the mouth, tail, and feet of the mouse, although some tadpoles also were feeding on algae growing in the tank. No other species of tadpoles were in the tank. Tadpoles that consume animal protein might experience enhanced growth rates (Crump 1990). Although tadpoles are known to feed on dead remains of many animals, to our knowledge, this is the first record of tadpoles feeding on a mammalian carcass. Videographic and photographic evidence of the event was deposited in the Zenodo data repository (Thakur 2023).

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